



**RCRA FACILITY  
INVESTIGATION  
PHASE I FINDINGS AND  
CONCLUSIONS  
FACILITY AT  
3200 MAIN STREET  
KEOKUK, IOWA**

**Prepared for**

**United Technologies Automotive  
Systems, Inc.  
Formerly Sheller-Globe  
Corporation  
Hartford, Connecticut**

**Schlegel Sealing Systems, Inc.  
Keokuk, Iowa  
August 1993**

**Woodward-Clyde**



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R00116861  
RCRA RECORDS CENTER

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August 20, 1993  
WCC Project 91C7343-1

Mr. Brian Mitchell  
U.S. Environmental Protection Agency  
Region VII, Iowa Section/Waste Management Division  
726 Minnesota Avenue  
Kansas City, Kansas 66101

Re: Summary of Phase I RFI Field Investigation  
and Recommendations for future RFI Activities  
at the 3200 Main Street Facility, Keokuk, Iowa

Dear Brian:

This letter is submitted on behalf of United Technologies Automotive Systems, Inc. (UTAS) and Schlegel Sealing Systems, Inc. (Schlegel). The purpose of this letter is to summarize the results, findings, and conclusions of the Phase I RFI Investigation and presents the Respondents recommended course of action for the remainder of the RFI at the 3200 Main Street Facility in Keokuk, Iowa. It is our understanding that a meeting between USEPA and the Respondents' has been tentatively scheduled for September 1, 1993, to discuss information presented in this letter. This letter is divided into two sections. The first section outlines the RFI results, findings, and conclusions by area of concern. The second section presents recommendations for the revised approach to the remainder of the RFI process.

### **SUMMARY OF PHASE I INVESTIGATION RESULTS**

The following sections briefly summarize the Phase I RFI conclusions and recommendations for each of the five areas of concern identified in the RFI Workplan. A more detailed summary of the individual investigation objectives, activities, findings, conclusions and recommendations are presented on the summary sheets in the Attachment to this letter. Additionally, the tabulated analytical results and drawings showing the sample locations are also presented in the Attachment.

#### **Investigation of Alleged On-site Buried Drums**

The investigation of the alleged on-site buried drums included an electromagnetic survey, the excavation and sampling of one test pit, and the drilling and sampling of six soil borings.

No buried drums were identified during the investigation, but very low levels of volatile contaminants, probably the result of former drum storage practices, were detected locally. Based upon the concentrations detected (3-4 orders of magnitude below proposed RCRA Subpart S action levels), the significant depth to groundwater and the nature of the glacial till soils, no further investigations or actions are recommended regarding the alleged on-site buried drums.

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till soils, no further investigations or actions are recommended regarding the alleged on-site buried drums.

### **Investigation of the Cooling Water Pond and Ditches**

The investigation results indicate that low levels of volatiles and semivolatiles and relatively low to high concentrations of petroleum hydrocarbons were detected in sediments of the cooling water pond as well as on-site ditches leading into the pond. Methylene chloride concentrations exceeding MCLs were detected in surface water samples taken from a ditch leading into the cooling pond and the cooling pond inlet. Petroleum hydrocarbons, acetone, lead, and high pH wastewater are currently being discharged to the cooling pond. Off-site sources may be contributing low concentrations of semivolatiles and petroleum hydrocarbons to the cooling pond via ditches from off-site. The analytical data suggests that the majority of petroleum hydrocarbons settle out into the cooling pond sediments and only very low levels of volatile organics are being discharged from the cooling pond.

No further action with respect to the investigation of the cooling water pond under the RFI is recommended.

### **Investigation of Apparent Spill Areas**

Several areas of apparent spills were identified for investigation during the RFI. These areas included the railcar unloading area, the area around the concrete basins, the old process oil tank, and a small area outside the northwest corner of Building 19A. The analytical results for the samples collected from these areas indicate that the stained areas primarily contain only petroleum hydrocarbons. The concentrations of various hazardous constituents were far below the proposed Subpart S Action levels. For this reason, no further investigation or action is recommended in the areas of stained soils at this active facility.

### **Investigation of Secondary Solvent Source in the Fill Material**

Volatile organic compounds were detected above the MCLs in groundwater samples collected in the vicinity of the former machine shop and the loading dock area. The relatively high concentration was 17 mg/L of toluene detected in the groundwater grab sample collected immediately south of the former machine shop (GW-08). The investigation did not identify any discrete source area of this contaminant. We suspect it is the result of general operational activities.

An investigation of the solvent contamination associated with the former underground solvent product storage tanks east of the chemical mix building is currently being performed.

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As part of this investigation, a soil vapor extraction (SVES) system is currently being designed to remediate the source of volatile organics in this area. For this reason, it is recommended that the solvent contamination near the former machine shop and the loading dock will be addressed in conjunction with the old underground product storage tank area project. Therefore, no further investigation at the present time under the RFI is recommended for the secondary solvent source areas. At the present time, we recommend completion of the final design and start up of the SVES system. Periodic sampling of the existing wells to monitor performance of this corrective action is recommended.

### **Investigation of the Rubble Area West of the Employee Parking Lot**

The investigation of the rubble area west of the employee parking lot included the excavation and sampling of four test pits. Additional data was also obtained from a fifth test pit excavated as part of the investigation of the alleged buried drums.

The results of the investigation indicate that limited disposal of demolition debris has occurred in the area west of the employee parking lot. Additionally, sediments reportedly dredged from the cooling water pond were encountered at one of the test pit locations. Trace amounts of volatile organics were detected in the sediments and in isolated areas of stained soil encountered in test pits TP-04 and TP-05. The soils in this area consist of tight glacial till clays with significant depth to groundwater. Based on the data obtained during the investigation, no further investigation or action is recommended with respect to the rubble area west of the employee parking lot.

### **RECOMMENDED COURSE OF ACTION**

As described in the brief summary of the RFI presented above, based on the findings of the Phase I investigation, the facility does not warrant a Phase II field investigation and no additional field work under the RFI is recommended.

Because no Phase II activities are necessary, it is recommended that a proposal be developed and submitted to the USEPA to accelerate the RFI process for the facility.

It is recommended that the proposed changes to the RFI program include the following components:

- No Phase II field investigation activities are required;



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- The Phase I data summary report should be replaced with a draft RFI report (a schedule extension of approximately 3 months will be necessary to prepare the draft RFI report);
- Recommendations to USEPA to combine the Secondary Solvent Source Area investigation with the former underground solvent product tank investigation;
- A Corrective Measures Study will not be performed, but UTAS should implement the SVES system.

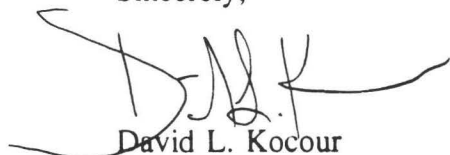
Considering the results of the Phase I investigation, it is not necessary to prepare a Phase I data summary report with conclusions and recommendations for Phase II activities. It is therefore recommended that a request for a 3 month extension be made to the USEPA and the draft RFI report be prepared in place of the Phase I data summary report. This will have the overall result of the draft RFI report being submitted much earlier than the existing schedule.

The source of the solvent contaminants detected near the former machine shop is unknown. However, considering the proximity and similar characteristics of this area with the former underground solvent product tanks area, the investigations should be combined and treated together as one unit.

As noted previously, we do not believe that it is necessary to perform a Corrective Measures Study (CMS) as currently required by the consent order. Periodic monitoring will be required during operation of the SVES system, then once it is complete, UTAS should reevaluate the levels of contaminants remaining in groundwater and the need (if any) for further study or remediation.

Please contact Mr. Brian J. Yeich at UTAS if you have any questions or comments. He can be reached at 203/728-7622.

Sincerely,



David L. Kocour  
Senior Staff Scientist



David A. Dods  
Senior Project Engineer

Attachments

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Consultants**

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cc: Brian J. Yeich - UTAS

Joseph Gregg, Esq. - Eastman & Smith

Harold Gibson - Schlegel

Dale Guaraglia - Bryan Cave

**ATTACHMENT**  
**OVERVIEW OF PHASE I RFI FIELD INVESTIGATION**

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## AREAS OF INVESTIGATION

- ALLEGED ON-SITE BURIED DRUMS
- COOLING WATER POND AND DITCHES
- APPARENT SPILL AREAS
- SECONDARY SOLVENT SOURCE AREAS IN FILL MATERIAL
- RUBBLE AREA WEST OF EMPLOYEE PARKING LOT
- BACKGROUND SOIL BORINGS

# ALLEGED ON-SITE BURIED DRUMS

## OBJECTIVES

- Supplement ESE's previous geophysical investigation and soil borings in employee parking lot, and to make a final determination as to whether or not buried drums are present beneath the employee parking lot; and
- Investigate the extent of shallow organic contaminants identified near the north-central portion of the employee parking lot (former ESE boring location B-2) and the southwest corner of the employee parking lot (former ESE boring location B-4).

## ACTIVITIES

- Conducted electromagnetic (EM) survey over a grid approximately 100 feet by 300 feet in an area located immediately west of employee parking lot (Drawings 2-1 through 2-4);
- Based on identification of an anomaly near the southern edge of the EM grid excavated an additional test pit (Drawing 2-1); and
- Advanced three borings around each of the two previous ESE borings near west end of employee parking lot (Drawing 2-1).

## FINDINGS

- Geophysics - Identified an anomaly near southwest corner of employee parking lot (Drawing 2-1).
- Test Pit - Revealed one 55 gallon drum lid near the surface (0-4 in.) and limited amount of soil staining (depth of 4 ft.) on north wall of pit; trace amounts (3-5 orders of magnitude below proposed Subpart S action levels) of volatiles identified in stained area and in natural soil from bottom of test pit TP-05 (Table 6-1); natural undisturbed glacial tills located within 6 in. of ground surface.
- Borings - Trace concentrations (4 orders of magnitude below proposed Subpart S action levels) of volatiles were identified near the surface and at a depth of 6-8 feet in one of three borings placed around former ESE boring B-2 (Table 2-1); encountered 6-9 ft. of fill underlain by glacial till in borings around former ESE boring B-2; no groundwater encountered to a depth of 18 ft.;

no detectable concentrations of contaminants identified in three borings placed around former ESE boring B-4 (Table 2-1); encountered glacial tills near the surface with little or no fill in borings around former ESE boring B-4; and no groundwater encountered to a depth of 36 ft.

## CONCLUSIONS

- Based on correlations between the conductivity (EM) data and the boring and test pit information, it appears that the higher conductivity near the southeast corner of the EM grid is geological in origin rather than due to buried metal. Additionally no inphase anomalies were observed in the EM grid which might be indicative of buried drums or significant amounts of buried metal; and
- Low levels of volatile contaminants (3-4 orders of magnitude below proposed Subpart S action levels) are present in an area with significant depth to groundwater and glacial till soils. Based upon the concentrations of contaminants observed in the boring and test pit, depth to groundwater in this area, and soils encountered there appears to be a minimal potential for migration and/or leaching of contaminants in this area.

## RECOMMENDATION

- Based upon the results of ESE's previous geophysical investigation and soil borings in the employee parking lot as well as work conducted in association with the first phase of the RFI, no further investigation or actions are recommended regarding the investigation of the alleged on-site buried drums.

# COOLING WATER POND AND DITCHES

## OBJECTIVES

- Supplement investigations previously conducted on the cooling pond and ditch leading into the cooling pond;
- Identify whether hazardous constituents are present in the sediment of the cooling pond and the ditch leading into the northeast inlet of the south arm of the cooling pond; characterize these hazardous constituents; and evaluate the extent of hazardous constituents across the cooling pond sediments;
- Evaluate whether hazardous constituents are present in the cooling pond waters and the waters leaving the cooling pond through the NPDES discharge;
- Evaluate whether hazardous constituents are entering the cooling pond from off-site sources via stormwater sewers; and
- Evaluate whether hazardous constituents are entering the cooling pond from on-site sources.

## ACTIVITIES

- Collected 6 sediment samples from the cooling pond and 1 grab sediment sample below the cooling pond outfall (Drawing 3-1);
- Collected 2 cooling pond surface water samples (one from near the northeast inlet of the south arm of the cooling pond and one from the cooling pond outfall);
- Collected 2 ditch sediment and surface water samples near property boundaries (representative of potential off-site sources);
- Collected 3 ditch sediment samples from on-site ditches leading into cooling pond (Drawings 3-1 and 3-2); and
- Collected 5 outfall samples from on-site discharge pipes leading into the cooling pond (Drawing 3-2).

## FINDINGS

### Cooling

#### Pond Sediments -

Trace concentrations of volatiles (4 orders of magnitude below proposed Subpart S action levels) distributed in sediments in portions of the north and south arms of the cooling pond (Table 3-1); bis(2-Ethylhexyl)phthalate (semivolatile) concentrations below proposed Subpart S action level distributed throughout sediments of the cooling pond; detectable concentrations (1.1-6.9



mg/kg) of a variety of semivolatiles located in northeast inlet of the south arm of the cooling pond near urban background soils concentrations (Table 3-1); relatively high concentrations (1200-29000 mg/kg) of petroleum hydrocarbons distributed throughout the pond (Table 3-1); and with the exception of a very low level of petroleum hydrocarbons (43 mg/kg) no detectable concentrations of organics identified in the sediment sample from below the cooling pond outfall (Table 3-1).

Cooling

Pond Water -

Methylene chloride exceeded the proposed Subpart S action level by a factor of 7, and acetone was present 1 order of magnitude below the proposed Subpart S action level, in the surface water sample collected from near the northeast inlet of the south arm of the cooling pond (Table 3-2); relatively low concentrations of petroleum hydrocarbons (540 µg/l), and acetone and MEK, 2 orders of magnitude below proposed Subpart S action levels (Table 3-2) detected in surface water at cooling pond outfall.

Off-Site Ditches -

Trace concentrations (0.64-1.4 mg/kg) of a variety of semivolatiles were identified in sediments from the ditch located near Main Street (Drawing 3-1 and Table 3-1), while petroleum hydrocarbon concentrations above 100 mg/kg were identified in sediments from both off-site ditches (Table 3-1); a petroleum hydrocarbon concentration of 210 µg/l was detected in a surface water sample from the ditch near the southeast corner of the employee parking lot and acetone was present 2 orders of magnitude below the proposed Subpart S action level in a surface water sample collected from the ditch near Main Street (Table 3-2).

On-Site Ditches -

Trace concentrations (1-4 orders of magnitude below proposed Subpart S action levels) of acetone and toluene were identified in sediments below the discharge pipes and ditch leading into the cooling pond; detectable concentrations (2.6-8.3 mg/kg) of semivolatiles near urban background soil concentrations (Table 3-3) were identified in ditch sediment located at the northeast inlet of the pond's south arm (Table 3-1); relatively high concentrations (4600-50,000 mg/kg) of petroleum hydrocarbons were identified in the on-site ditch sediments (Table 3-1); low concentrations (1-2 orders of magnitude below proposed Subpart S action level) of acetone were identified in 4 of the 5 pipes sampled and in the fifth pipe acetone was detected at a concentration 19 times the proposed Subpart S action level (Table 3-2); surface water samples from 3 of the 5 discharge pipes exceeded the MCL action level for

total lead (Table 3-2); a surface water sample from 1 of the 5 pipes also had a pH value of 11.46; and a surface water sample collected from the ditch near the northeast inlet of the south arm of the pond contained methylene chloride at a concentration 5 times the proposed Subpart S action level and acetone 1 order of magnitude below the proposed Subpart S action level.

## CONCLUSIONS

- Trace amounts of volatiles, below Subpart S action levels, are present in pond sediments located in the north and south arms of the cooling pond.
- One semivolatile compound, bis(2-Ethylhexyl) phthalate appears to be distributed throughout the cooling pond sediments in concentrations below the Subpart S action level.
- Low concentrations, most of which are below background soil concentrations typically found in urban soils, of a variety of semivolatile compounds are present in sediments located in the northeast inlet of the south arm of the pond.
- Relatively high concentrations of petroleum hydrocarbons are distributed throughout the pond sediments while a comparatively low concentration of petroleum hydrocarbons is present in sediments below the outfall of the cooling pond. The majority of petroleum hydrocarbons entering the cooling pond appear to be settling out in the pond sediments.
- Methylene chloride concentrations exceeding proposed Subpart S action levels were detected in surface water samples taken from a ditch leading into the cooling pond and near the northeast inlet of the south arm of the pond.
- Volatiles, below Subpart S action levels, and some petroleum hydrocarbons are being discharged from the cooling pond.
- Off-site sources maybe contributing low concentrations of semivolatiles and petroleum hydrocarbons to ditches leading into the cooling pond.
- Acetone, petroleum hydrocarbons, lead, and high pH wastewaters are currently being discharged into a ditch leading into the pond.

## RECOMMENDATION

- Based upon the results of previous investigations involving the cooling pond and ditches leading into the cooling pond, as well as work conducted in association with the first phase of the RFI, no further investigation of the cooling pond under the RFI is recommended.

# INVESTIGATION OF APPARENT SPILL AREAS

## OBJECTIVES

- Identify whether or not hazardous constituents are present in the stained areas and to a limited degree, the extent of such constituents in the areas of stained soils.

## ACTIVITIES

- Collected 4 surface soil samples near the railcar unloading area (Drawing 4-1);
- Advanced 5 soil borings in the apparent spill areas (Drawing 4-1);
- Collected groundwater grab samples from 2 of the 5 soil borings (Drawing 4-1); and
- Collected groundwater samples from 2 existing monitoring wells in the vicinity of the apparent spill areas (Drawing 4-1).

## FINDINGS

- Trace amounts of volatiles (3-6 orders of magnitude below proposed Subpart S action levels) and semivolatiles (2.6-28 mg/kg) near urban and railroad background soil concentrations (Table 3-3) were identified in surface soils and soil samples from borings around the former process oil tanks, railroad track, and concrete basins (Table 4-1). Relatively high concentrations (670-32000 mg/kg) of petroleum hydrocarbons were also identified in these areas.
- The high concentrations of petroleum hydrocarbons in soil samples appears to have resulted in elevated semivolatile detection limits (Table 4-1).
- Exceeded MCL and MCL action level (lead) for total metals in groundwater samples GW-01, GW-02 and OP-3 (Table 4-2). However, dissolved metals concentrations did not exceed MCL's in any of the samples (Table 4-2). Total metals samples were turbid.
- Large variation in analytical results between the groundwater grab sample collected from soil boring SB-02 and groundwater monitoring well OP-1 even though locations are in very close proximity of each other (Drawing 4-1 and Table 4-2).

## CONCLUSIONS

- Soils in the vicinity of the railroad track, the concrete basins, and the former process oil tanks appear to contain low levels of volatiles and semivolatiles but high levels of petroleum hydrocarbons. Volatiles levels are below action criteria; semivolatiles are comparable to urban background levels.
- Elevated total metals concentrations in groundwater grab samples may be attributed to EPA mandated sampling technique.
- Petroleum hydrocarbons, although present in elevated concentrations, do not appear to contain hazardous constituents.

#### RECOMMENDATIONS

- Based upon work conducted in association with the first phase of the RFI, no further investigation or actions are recommended regarding the investigation of the apparent spill areas.

# INVESTIGATION OF SECONDARY SOLVENT SOURCE AREAS IN THE FILL MATERIAL

## OBJECTIVES

- Characterize areas of solvent-contaminated fill which have not been previously addressed in association with the investigation of the former underground solvent product tanks.

## ACTIVITIES

- Advanced and collected soil and groundwater grab samples from 8 borings (Drawing 5-1); and
- Conducted interviews with plant personnel in an attempt to identify areas of known spills or disposal (secondary sources) in the vicinity of the former Machine Shop.

## FINDINGS

- Trace amounts of volatiles (3-7 orders of magnitude below proposed Subpart S action levels) were detected in soil samples from all 8 borings (Table 5-1). Low levels of semivolatiles (0.38-13 mg/kg) near urban background soil concentrations (Table 3-3) were also detected in soil samples from 7 of the 8 borings (Table 5-1). A soil sample collected from a boring located north of the former Machine Shop (SB-06) contained a wide variety of semivolatiles slightly above urban background soil concentrations (Table 5-1). Petroleum hydrocarbon concentrations in soil samples from the 8 borings ranged in concentration from 21-7600 mg/kg (Table 5-1).
- Volatiles above MCL and/or the proposed Subpart S action levels were detected in groundwater grab samples GW-06, GW-08, GW-11, GW-12, and GW-13 (Table 5-2). One semivolatile compound (2-Methylphenol) was detected in groundwater grab sample GW-07 at a concentration of 1700 µg/l (Table 5-2).
- Several total metals concentrations were above their appropriate MCL in groundwater grab samples GW-06, GW-07, GW-09, GW-11, GW-12, and GW-13 (Table 5-2). However, dissolved metals concentrations exceeded MCL in only groundwater grab sample GW-07 (Table 5-2).
- Petroleum hydrocarbons were detected in all 8 groundwater grab samples and ranged in concentration from 110-900 µg/l (Table 5-2).

## CONCLUSIONS

- Soils in the fill material appear to contain low levels of volatiles and semivolatiles, and relatively high levels of petroleum hydrocarbons.
- The wide variety of semivolatiles identified in SB-06 may be due to historic coal storage and ash/slag disposal near this area.
- Secondary solvent sources may be present in the vicinity of GW-06, GW-08, GW-11, GW-12 and GW-13 (VOCs over the MCLs and/or proposed Subpart S action levels).
- Total metals concentrations in groundwater grab samples are attributed to the EPA mandated sampling technique.

## RECOMMENDATIONS

- No further investigation of the secondary solvent source areas in the fill material is recommended under the RFI. Rather, since this general area is already the subject of an ongoing investigation it is recommended that further investigation of the secondary solvent source areas be incorporated into the ongoing solvent product tank project. These two areas should be addressed as a single entity.

# RUBBLE AREA WEST OF EMPLOYEE PARKING LOT

## OBJECTIVES

- Characterize nature of debris placed in the area west of the employee parking lot; and
- Identify and sample dredged cooling pond sediments reportedly placed in the area.

## ACTIVITIES

- Excavated 5 test pits (one of which was in association with the geophysical survey), west of employee parking lot (Drawing 6-1).

## FINDINGS

- Trace amounts of volatiles (3-8 orders of magnitude below the proposed Subpart S action levels) found in all 5 test pits at varying depths (Table 6-1);
- Sediments and gravel identified in TP-02 (Drawing 6-1);
- Identified small quantity of red paint-like substance in TP-04 that contained trace amounts of volatiles (3-8 orders of magnitude below proposed Subpart S action levels) and semivolatiles (estimated values of 0.48-0.53 mg/kg);
- Identified one 55 gallon drum lid near the surface in TP-05 and a limited amount of soil staining (depth of 4 ft.) on the north wall of the test pit that contained trace amounts (3-5 orders of magnitude below proposed Subpart S action levels) of volatiles (Table 6-1);
- Identified demolition debris in TP-01 and TP-02 (Drawing 6-1); and
- With the exception of TP-02, which contained sediments, less than 4 ft. of fill was identified in any of the test pits.

## CONCLUSIONS

- Limited disposal of demolition debris has occurred in the area west of the employee parking lot;
- Sediments were disposed of in the vicinity of TP-02;
- Trace amounts of volatiles and semivolatiles are present in sediments identified in TP-02 and in isolated areas of staining observed in TP-04 and TP-05 (volatiles only); and



- Soils in the area west of the employee parking lot consist of glacial tills located near the ground surface with significant depth to groundwater and hence a low potential for the migration and/or leaching of contaminants.

#### RECOMMENDATION

- Based upon work conducted in association with the first phase of the RFI, no further investigation or actions are recommended regarding the investigation of the area west of the employee parking lot.

# BACKGROUND SOIL BORINGS

## OBJECTIVE

- Establish background concentrations for soils and groundwater media;

## ACTIVITIES

- Advanced two soil borings along Main Street and collected soil samples from both borings, and a groundwater grab sample from the southernmost boring (Drawing 7-1).

## FINDINGS

- No detectable concentrations of organic contaminants were identified in soil samples collected from the background boring near northeast corner of property;
- Detectable concentrations of semivolatiles (0.39-5.9 mg/kg) and petroleum hydrocarbons (76-79 mg/kg) as well as gasoline odors were identified in soil samples from the background boring near the southeast corner of property (Table 7-1); and
- Trace amounts of volatiles (1 order of magnitude below MCL) and semivolatiles (10-36 µg/l), and total metals in excess of MCL were identified in the groundwater grab sample from the boring located on the southeast corner of the property (Table 7-2).

## CONCLUSIONS

- The background boring near the northeast corner of property appears to be representative of land uses north of the property, which include undeveloped and developing land.
- The background boring near the southeast corner of the property is representative of commercial and industrial land use. An off-site source of contaminants appears to exist near the plant property. It is believed that the presence of petroleum hydrocarbons and gasoline odors may be attributed to several current, and/or former, gasoline service stations located in the near vicinity of the plant. Heavy vehicular road traffic and road materials may have also contributed to semivolatile and metals concentrations detected in soil samples collected from the boring.

**TABLE 7-2**  
**BACKGROUND SOIL BORINGS**  
**Concentrations of Compounds Detected - Groundwater**

Parameter	Maximum Contaminant Levels (µg/L)	Draft RCRA Subpart S Criteria (µg/L)	Sample ID
			GW-14
<b>Volatiles (µg/L)</b>			
1,1,1-Trichloroethane	200	3000	11
Ethylbenzene	700	4000	120
Hexane	NE	NE	88
Xylenes (total)	10000	70000	140
<b>SemiVolatiles (µg/L)</b>			
2-Methylnaphthalene	NE	NE	10
Naphthalene	NE	NE	36
<b>Dissolved Metals (µg/L)</b>			
Barium	2000	NE	170
<b>Total Metals (µg/L)</b>			
Arsenic	50	NE	200 J
Barium	2000	NE	1900
Cadmium	5	NE	16
Chromium	100	NE	700
Lead*	15	NE	92
Mercury	2	NE	1.9
<b>Others</b>			
Extractable Petroleum Hydrocarbons (µg/L)	NE	NE	3000

Notes: U : Not Detected.  
J : Estimated Value.  
NA : Not Analyzed.  
NE : Not Established.  
\* : MCL for lead represents treatment technique action level

## TABLES

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**TABLE 2-1**  
**INVESTIGATION OF ALLEGED ON-SITE BURIED DRUMS**  
**Concentrations of Compounds Detected - Soil**

Parameter	Draft RCRA Subpart S Criteria (mg/kg)	Sample ID											
		SB-16-0.5-2.5	SB-16-6-8	SB-17-0-2	SB-17-6-8	SB-18-0.5-2.5	SB-18-6-8	SB-19-0.5-2.5	SB-19-6-8	SB-20-0-2	SB-20-6-8	SB-21-0-2	SB-21-6-8
<b>Volatiles (mg/kg)</b>													
2-Butanone (MEK)	4000	0.012 U	0.012 U	0.013 U	0.011 U	0.021	0.015	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U
Acetone	8000	0.026 U	0.077 U	0.027 U	0.092 U	0.19	0.054	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U
<b>SemiVolatiles (mg/kg)*</b>													

Notes: U : Not Detected.

J : Estimated Value

NA : Not Analyzed

NE : Not Established.

\*: Samples from borings SB-16, SB-17, and SB-18 were also analyzed for semivolatiles however no semivolatile compounds were detected. Samples from borings SB-19, SB-20, and SB-21 were not analyzed for semivolatiles.

**TABLE 3-1**  
**INVESTIGATION OF COOLING WATER POND AND DITCHES**  
**Concentrations of Compounds Detected - Sediment**

		Sample ID										
		Pond						Ditch				
Parameter	Draft RCRA Subpart S Criteria (mg/kg)	SDP-01	SDP-02	SDP-03	SDP-04	SDP-05	SDP-06	SDD-01	SDD-02	SDD-03	SDD-04	SDD-05
Volatiles (mg/kg)												
Acetone	8000	0.013 U	0.037 U	0.22	0.026 U	0.16 U	0.016 U	0.84	0.014 U	0.055 U	4.2 U	140
Hexane	NE	0.0065 U	0.018 U	0.027 U	0.013 U	0.12	0.0088	0.075 U	0.0071 U	0.008 U	2.1 U	13 U
Toluene	20000	0.0065 U	0.018 U	0.027 U	0.25	0.08 U	0.0079 U	0.075 U	0.0071 U	0.008 U	70	13 U
Xylenes (total)	200000	0.0065 U	0.018 U	0.027 U	0.029	0.08 U	0.011	0.075 U	0.0071 U	0.008 U	2.1 U	13 U
SemiVolatiles (mg/kg)												
4-Methylphenol	NE	0.43 U	4.9 U	7.2 U	8.4 U	2.6	0.52 U	2 U	0.47 U	0.53 U	4.7 U	4.3 U
Benzo(a)anthracene	NE	0.43 U	4.9 U	7.2 U	8.4 U	2	0.52 U	3.3	0.47 U	0.87	4.7 U	4.3 U
Benzo(a)pyrene	NE	0.43 U	4.9 U	7.2 U	8.4 U	1.1 U	0.52 U	2.6	0.47 U	0.53 U	4.7 U	4.3 U
Benzo(b)fluoranthene	NE	0.43 U	4.9 U	7.2 U	8.4 U	1.7	0.52 U	3.9	0.47 U	0.66	4.7 U	4.3 U
Chrysene	NE	0.43 U	4.9 U	7.2 U	8.4 U	1.1	0.52 U	2.9	0.47 U	0.53 U	4.7 U	4.3 U
Fluoranthene	NE	0.43 U	4.9 U	7.2 U	8.4 U	6.9	1	7.3	0.47 U	1.4	4.7 U	4.3 U
Phenanthrene	NE	0.43 U	4.9 U	7.2 U	8.4 U	2.4	0.52 U	8.3	0.47 U	0.53 U	4.7 U	4.3 U
Pyrene	NE	0.43 U	4.9 U	7.2 U	8.4 U	1.9	0.52 U	8.2	0.47 U	0.64	4.7 U	4.3 U
bis(2-Ethylhexyl)phthalate	50	0.43 U	15	16	16	5.3	1.4	7.3	0.47 U	0.53 U	4.7 U	20
Metals (mg/kg)												
Arsenic	80	3.1 J	4.8 J	4.9 J	3.8 J	3.9 J	4.7 J	4.2 J	7.6 J	11.2 J	4.1 J	1.4 J
Barium	6000	63.4	144	133	116	94.6	68.8	106	71.7	161	89.7	20.3
Cadmium	40	0.69	5.8	6.1	7	1.9	1.1	2.3	1.3	0.8 U	1.9	1.9
Chromium *	400	8.6	19.3	19.8	21	21.6	8.6	19.5	6.8	12	15.1	7.4
Lead	NE	6.5 U	65.2	56.8	72.2	88.6	33.8	80	23	28.5	45.5	30.8
Others												
Extractable Petroleum Hydrocarbons (mg/kg)	NE	43	16000	29000	24000	5900	1200	5600	620	250	50000	4600

Notes: U : Not Detected.  
J : Estimated Value.  
NA : Not Analyzed.  
NE : Not Established  
\* : Chromium action level is for Chromium VI.

**TABLE 3-2**  
**INVESTIGATION OF COOLING WATER POND AND DITCHES**  
**Concentrations of Compounds Detected - Surface Water**

Parameter	Maximum Contaminant Levels (µg/L)	Draft RCRA Subpart S Criteria (µg/L)	Sample ID									
			Pond		Ditch			Pipes				
			SWP-01 (Outlet)	SWP-02 (Inlet)	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	SWD-06	SWD-07	SWD-08
<b>Volatiles (µg/L)</b>												
Acetone	NE	4000	88	560	500	10 U	12	60	1100	430	230	76000
Methylene chloride	NE	5	5 U	37	28	5 U	5 U	5 U	100 U	25 U	10 U	5 U
2-Butanone (MEK)	NE	2000	23	50 U	33 U	10 U	10 U	10 U	200 U	50 U	20 U	10 U
<b>Semivolatiles (µg/L)*</b>												
<b>Dissolved Metals (µg/L)</b>												
Barium	2000	NE	NA	NA	24	11	75	NA	NA	NA	NA	NA
Chromium	100	NE	NA	NA	1 U	12 U	10 U	NA	NA	NA	NA	NA
<b>Total Metals (µg/L)</b>												
Barium	2000	NE	23	37	64	100	98	50	74	33	11	58
Lead**	15	NE	10 U	5 U	25 U	10 U	10 U	10 U	16	10 U	110	33
<b>Others</b>												
pH	NE	NE	8.99	8.81	7.3	7.39	7.01	7.16	7.14	8.8	11.46	8.02
Total Dissolved Solids (mg/L)	NE	NE	340	341	540	606	423	819	485	307	926	302
Total Suspended Solids (mg/L)	NE	NE	14.8	40.8	127	12.4	18.4	7.2	24	11.6	27.6	435
Extractable Petroleum Hydrocarbons (µg/L)	NE	NE	540	330	930	210	100 U	1300	1200	1300	220	21000

Notes: U : Not Detected

J : Estimated Value

NA : Not Analyzed

NE : Not Established

\* : Samples were analyzed for semivolatiles however no semivolatile compounds were detected in the surface water samples

\*\* : MCL for lead represents treatment technique action level.



**TABLE 4-1**  
**INVESTIGATION OF APPARENT SPILL AREAS**  
**Concentrations of Compounds Detected - Soil**

		Sample ID									
	Draft RCRA Subpart S Criteria (mg/kg)										
Parameter		SB-01-0-2	SB-01-4-6	SB-02-0-2	SB-02-4-6	SB-03-0-2	SB-03-4-6	SB-04-0-1.5	SB-04-4-5.5	SB-05-0-2	SB-05-4-6
Volatiles (mg/kg)											
1,1,1-Trichloroethane	7000	0.0063 U	0.0058 U	0.0059 U	0.006 U	0.0059 U	0.0058 U	0.0054 U	0.006 U	0.0053 U	0.0057 U
2-Butanone (MEK)	4000	0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.015	0.011 U	0.012 U	0.011 U	0.011 U
Acetone	8000	0.013 U	0.012 U	0.012 U	0.041	0.012 U	0.056 U	0.011 U	0.022	0.014 U	0.018
Hexane	NE	0.0063 U	0.0058 U	0.0059 U	0.006 U	0.0059 U	0.0058 U	0.0054 U	0.006 U	0.0053 U	0.0057 U
Methylene chloride	90	0.0063 U	0.0058 U	0.0076	0.01	0.0059 U	0.0058 U	0.0054 U	0.006 U	0.0053 U	0.0057 U
Tetrachloroethene	10	0.0063 U	0.0058 U	0.0059 U	0.006 U J	0.0059 U	0.0058 U	0.0054 U	0.0069	0.017	0.043
Toluene	20000	0.0063 U	0.0058 U	0.0059 U	0.006 J	0.0059 U	0.0058 U	0.0054 U	0.11	0.0053 U	0.0057 U
SemiVolatiles (mg/kg)											
Benzo(a)anthracene	NE	0.42 U	0.38 U	0.39 U	1.6 U	0.78 U	3.8 U	18 U	20 U	3.5 U	0.38 U
Butyl benzyl phthalate	20000	0.42 U	0.38 U	0.39 U	1.6 U	0.82	3.8 U	18 U	20 U	3.5 U	0.38 U
Chrysene	NE	0.42 U	0.38 U	0.39 U	1.6 U	0.78 U	3.8 U	18 U	20 U	3.5 U	0.38 U
Di-n-octyl phthalate	NE	0.42 U	0.38 U	0.39 U	2.6	0.78 U	3.8 U	18 U	20 U	3.5 U	0.38 U
Fluoranthene	NE	0.42 U	0.38 U	0.39 U	1.6 U	0.78 U	3.8 U	18 U	20 U	3.5 U	0.38 U
Phenanthrene	NE	0.42 U	0.38 U	0.39 U	1.6 U	0.78 U	3.8 U	18 U	20 U	3.5 U	0.38 U
Pyrene	NE	0.42 U	0.38 U	0.39 U	1.6 U	0.78 U	3.8 U	18 U	20 U	3.5 U	0.38 U
bis(2-Ethylhexyl)phthalate	50	0.42 U	0.38 U	0.39 U	2.6	0.78 U	3.8 U	28	20 U	3.5 U	0.38 U
Metals (mg/kg)											
Arsenic	80	4.8 J	0.7 J	5.1 J	7 J	4.4 J	3.2 J	2.9 J	1.2 J	2.7 U	5.4 J
Barium	6000	40.9	39.3	144	176	87.6	64.9	22	34.3	19.4	103
Cadmium	40	0.66	0.58 U	1.7	0.74	0.59 U	0.58 U	0.54 U	0.6 U	1.5	1.9
Chromium *	400	8.2	17.7	10.1	11.3	7.3	5.4	3.3	5.3	4	10.8
Lead	NE	8.3	5.8 U	42.8	33.2	8.1	18.1	5.9	10.1	58.3	143
Mercury	20	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.11 U	0.12 U	0.11 U	0.18
Others											
Extractable Petroleum Hydrocarbons (mg/kg)	NE	48	7	1800	670	1500	9400	32000	17000	3300	1900

Notes: U : Not Detected  
J : Estimated Value.  
NA : Not Analyzed.  
NE : Not Established.  
\* : Chromium action level is for Chromium VI

**TABLE 4-1**  
**INVESTIGATION OF APPARENT SPILL AREAS**  
**Concentrations of Compounds Detected - Soil**

		Sample ID			
Parameter	Draft RCRA Subpart S Criteria (mg/kg)	SS-01	SS-02	SS-03	SS-04
Volatiles (mg/kg)					
1,1,1-Trichloroethane	7000	0.0054 U	0.014	0.006 U	0.014 U
2-Butanone (MEK)	4000	0.011 U	0.011 U	0.012 U	0.028 U
Acetone	8000	0.011 U	0.011 U	0.012 U	0.028 U
Hexane	NE	0.0054 U	0.026	0.0072	0.014 U
Methylene chloride	90	0.0054 U	0.0054 U	0.006 U	0.014 U
Tetrachloroethene	10	0.0054 U	0.12	0.006 U	0.014 U
Toluene	20000	0.0054 U	0.016	0.006 U	0.014 U
SemiVolatiles (mg/kg)					
Benzo(a)anthracene	NE	3.6 U	1.6	4.6	15 U
Butyl benzyl phthalate	20000	3.6 U	1.4 U	4 U	15 U
Chrysene	NE	3.6 U	2	4 U	15 U
Di-n-octyl phthalate	NE	3.6 U	1.4 U	4 U	15 U
Fluoranthene	NE	3.6 U	5.6	8.5	15 U
Phenanthrene	NE	3.6 U	1.6	4 U	15 U
Pyrene	NE	3.6 U	15	4.4	15 U
bis(2-Ethylhexyl)phthalate	50	3.6 U	1.4 U	4 U	15 U
Metals (mg/kg)					
Arsenic	80	2.8 J	1.3 J	4.1 J	5.6 J
Barium	6000	22.8	27.9	33.3	91.2
Cadmium	40	5.4 U	0.54 U	1.6	2.7
Chromium *	400	10.8 U	4.3	48.9	10.2
Lead	NE	53.9 U	395	60.9	144
Mercury	20	0.11 U	0.11 U	0.12 U	0.11 U
Others					
Extractable Petroleum Hydrocarbons (mg/kg)	NE	810	480	1400	16000

Notes: U : Not Detected.  
J : Estimated Value.  
NA : Not Analyzed.  
NE : Not Established.  
\* : Chromium action level is for Chromium VI

**TABLE 4-2**  
**INVESTIGATION OF APPARENT SPILL AREAS**  
**Concentrations of Compounds Detected - Groundwater and Groundwater Grab Samples**

Parameter	Maximum Contaminant Levels (µg/L)	Draft RCRA Subpart S Criteria (µg/L)	Sample ID			
			GW-01	GW-02	OP-1	OP-3
<b>Volatiles (µg/L)</b>						
Acetone	NE	4000	10 U	15	10 U	10 U
<b>SemiVolatiles (µg/L)*</b>						
<b>Dissolved Metals (µg/L)</b>						
Arsenic	50	NE	5 U	10 U	5 U	22 J
Barium	2000	NE	88	44	39	28
Chromium	100	NE	10 U	82	10 U	10 U
<b>Total Metals (µg/L)</b>						
Arsenic	50	NE	85 J	150 J	5 U	21 J
Barium	2000	NE	680	2400	850	400
Cadmium	5	NE	5.7	5 U	5 U	5 U
Chromium	100	NE	200	390	14	24
Lead**	15	NE	68	450	10 U	59
Mercury	2	NE	0.54	0.98	0.2 U	0.2 U
<b>Others</b>						
Extractable Petroleum Hydrocarbons (µg/L)	NE	NE	300	31000	1100	400

Notes: U : Not Detected.  
J : Estimated Value.  
NA : Not Analyzed.  
NE : Not Established.

\*: Samples were analyzed for semivolatiles however no semivolatile compounds were detected in the groundwater samples.

\*\*: MCL for lead represents treatment technique action level

**TABLE 5-1**  
**INVESTIGATION OF SECONDARY SOLVENT SOURCE AREAS IN FILL MATERIAL**  
**Concentrations of Compounds Detected - Soil**

		Sample I.D.						
Parameter	Draft RCRA Subpart S Criteria (mg/kg)	SB-06-0.5-2.5	SB-07-0.5-2.5	SB-07-4-6	SB-08-0.5-2.5	SB-08-18-20	SB-09-0.5-2.5	SB-10-1-3
Volatiles (mg/kg)								
1,2-Dichloroethene (total)	NE	0.0055 U J	0.036	0.0056 U	0.48	0.056 U	0.0058 U	0.0053 U
2-Butanone (MEK)	4000	0.034 J	0.012 U	0.011 U	0.11 U	0.11 U	0.012 U	0.011 U
Acetone	8000	0.230 J	0.012 U	0.076	0.11 U	0.11 U	0.016 U	0.011 U
Benzene	NE	0.011 J	0.0061 U	0.0056 U	0.055 U	0.056 U	0.0058 U	0.0053 U
Carbon disulfide	4	0.0055 U J	0.0061 U	0.0056 U	0.055 U	0.056 U	0.0058 U	0.0053 U
Hexane	NE	0.0085 J	0.0061 U	0.0056 U	0.055 U	0.056 U	0.0058 U	0.0053 U
Methylene chloride	90	0.040 J	0.015	0.0083 U	0.056	0.062 U	0.0077	0.018
Tetrachloroethene	10	0.0093 U	0.067 J	0.0056 U	0.092	0.056 U	0.0058 U	0.0053 U J
Toluene	20000	0.016 J	0.0061 U J	0.0056 U	0.055 U	0.51	0.0058 U	0.006 J
Xylenes (total)	200000	0.0095 J	0.0061 U J	0.0056 U	0.055 U	0.086	0.0058 U	0.0053 U J
SemiVolatiles (mg/kg)								
2-Methylnaphthalene	NE	0.72	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.71
Anthracene	NE	0.62	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Benzo(a)anthracene	NE	3.2	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Benzo(a)pyrene	NE	1.3	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Benzo(b)fluoranthene	NE	1.8	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Benzo(g,h,i)perylene	NE	0.64	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Benzo(k)fluoranthene	NE	0.85	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Chrysene	NE	1.6	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Di-n-octyl phthalate	NE	0.36 U	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.45
Dibenzofuran	NE	0.38	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Fluoranthene	NE	5.7	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Indeno(1,2,3-cd)pyrene	NE	0.66	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Naphthalene	NE	0.38	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Phenanthrene	NE	2.7	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
Pyrene	NE	1.9	4 U	3.7 U	1.5 U	0.37 U	0.38 U	0.35 U
bis(2-Ethylhexyl)phthalate	50	4.4	13	3.7 U	1.5	0.37 U	4.8	2.3
Metals (mg/kg)								
Arsenic	80	14.4 J	10 J	8.2 J	3.8 J	3.3 J	5.8 U	5.8 J
Barium	6000	129	251	143	81.9	65.4	184	82.2
Cadmium	40	2.3	6.9	0.56 U	2.2	0.56 U	2	4.4
Chromium *	400	35.3	27.4	13.1	11	8.7	11.1	6
Lead	NE	293	306	19.4	83.5	5.6 U	29.5	73
Mercury	20	0.13	0.12 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U
Others								
Extractable Petroleum Hydrocarbons (mg/kg)	NE	1400	7600	360	2500	4.5 U	560	840

**TABLE 5-1**  
**INVESTIGATION OF SECONDARY SOLVENT SOURCE AREAS IN FILL MATERIAL**  
**Concentrations of Compounds Detected - Soil**

		Sample ID			
Parameter	Draft RCRA Subpart S Criteria (mg/kg)	SB-10-11-13	SB-11-0.5-2.5	SB-12-0.5-2.5	SB-13-0.5-2.5
Volatiles (mg/kg)					
1,2-Dichloroethene (total)	NE	0.0058 U	0.0064 U	0.0055 U	0.0056 U J
2-Butanone (MEK)	4000	0.012 U	0.013 U	0.011 U	0.012 U
Acetone	8000	0.055	0.013 U	0.066	0.075 J
Benzene	NE	0.0058 U	0.0064 U	0.0055 U	0.006 J
Carbon disulfide	4	0.0058 U	0.0064 U	0.0055 U	0.0062 U J
Hexane	NE	0.0058 U	0.0064 U	0.0055 U	0.010 J
Methylene chloride	90	0.0073	0.0064 U	0.0082 U	0.015 U
Tetrachloroethene	10	0.0058 U	0.0064 U	0.0055 U	0.0056 U J
Toluene	20000	0.0058 U	0.0074	0.0055 U	0.022 J
Xylenes (total)	200000	0.0058 U	0.0064 U	0.067	0.0056 U J
SemiVolatiles (mg/kg)					
2-Methylnaphthalene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Anthracene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Benzo(a)anthracene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Benzo(a)pyrene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Benzo(b)fluoranthene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Benzo(g,h,i)perylene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Benzo(k)fluoranthene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Chrysene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Di-n-octyl phthalate	NE	0.38 U	0.42 U	0.36 U	0.37 U
Dibenzofuran	NE	0.38 U	0.42 U	0.36 U	0.37 U
Fluoranthene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Indeno(1,2,3-cd)pyrene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Naphthalene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Phenanthrene	NE	0.38 U	0.42 U	0.36 U	0.37 U
Pyrene	NE	0.38 U	0.42 U	0.36 U	0.37 U
bis(2-Ethylhexyl)phthalate	50	0.38 U	0.42 U	0.49	0.54
Metals (mg/kg)					
Arsenic	80	3.5 J	5.1 J	3.1 J	4.6 J
Barium	6000	62.3	150	45	36.1
Cadmium	40	0.58 U	0.64 U	0.55 U	3.2
Chromium *	400	9.6	13.1	6.9	6.3
Lead	NE	10	18.5	12.7	29.2
Mercury	20	0.12 U	0.13 U	0.11 U	0.11 U
Others					
Extractable Petroleum Hydrocarbons (mg/kg)	NE	280	21	71	700

Notes: U : Not Detected  
J : Estimated Value  
NA : Not Analyzed  
NE : Not Established  
\* : Chromium action level is for Chromium VI.

**TABLE 5-2**  
**INVESTIGATION OF SECONDARY SOLVENT SOURCE AREAS IN FILL MATERIAL**  
**Concentration of Compounds Detected - Groundwater Grab Samples**

			Sample ID							
Parameter	Maximum Contaminant Levels (µg/L)	Draft RCRA Subpart S Criteria (µg/L)	GW-06	GW-07	GW-08	GW-09	GW-10	GW-11	GW-12	GW-13
Volatiles (µg/L)										
1,2-Dichloroethene (total)	70	NE	24	6.6	840 U	5 U	5 U	16	8.5 U	6.9
Acetone	NE	4000	17 U	10 U	1700 U	10	28	11	17 U	18
Carbon tetrachloride	5	0.3	8.5 U	5 U	840 U	5 U	5 U	5 U	21	5 U
Chloroform	100	6	8.5 U	5 U	840 U	5 U	5 U	5 U	43	5 U
Ethylbenzene	700	4000	8.5 U	5 U	840 U	5 U	5 U	5 U	73	5 U
Tetrachloroethene	5	0.7	160	5 U	840 U	5 U	5 U	5 U	8.5 U	7
Toluene	1000	10000	8.5 U	5 U	17000	5 U	5 U	5 U	11	5 U
Trichloroethene	5	NE	8.5 U	5 U	840 U	5 U	5 U	18	8.5 U	5.7
Xylenes (total)	10000	70000	8.5 U	5 U	840 U	5 U	5 U	5 U	430	5 U
SemiVolatiles (µg/L)										
2-Methylphenol	NE	NE	10 U	10 U	1700	10 U	10 U	10 U	10 U	10 U
Dissolved Metals (µg/L)										
Barium	2000	NE	75	64	240	110	41	41	99	91
Cadmium	5	NE	5 U	7	5 U	5 U	5 U	5 U	5 U	5 U
Silver	NE	NE	100 U	10 U	12 U	10 U	10 U	10 U	10 U	10 U
Total Metals (µg/L)										
Arsenic	50	NE	8.2 J	10 U	5 U	25 U	10 U	170 J	88 J	27 J
Barium	2000	NE	170	5800	300	660	91	3500	3500	820
Cadmium	5	NE	5 U	35	5 U	5 U	5 U	18	34	5 U
Chromium	100	NE	25	650	10 U	43	10 U	760	680	130
Lead*	15	NE	41	500	10 U	43	10 U	290	440	54
Mercury	2	NE	0.2 U	1.7	0.2 U	0.2 U	0.2 U	0.56	1.5	0.2 U
Others										
Extractable Petroleum Hydrocarbons (µg/L)	NE	NE	150	330	590	110	900	400	410	670

Notes: U : Not Detected.  
J : Estimated Value  
NA : Not Analyzed  
NE : Not Established.  
\* : MCL for lead represents treatment technique action level



**TABLE 6-1**  
**INVESTIGATION OF RUBBLE AREA WEST OF EMPLOYEE PARKING LOT**  
**Concentrations of Compounds Detected - Soil**

		Sample ID										
Parameter	Draft RCRA Subpart S Criteria (mg/kg)	TP-01-SR-A (Surface)	TP-01-SR-B (Surface)	TP-01-N (Natural)	TP-02-GR (Gravel)	TP-02-SD (Sediment)	TP-02-N (Natural)	TP-03-SR (Surface)	TP-03-N (Natural)	TP-04-SR (Surface)	TP-04-ST (Stain)	TP-04-N (Natural)
Volatiles (mg/kg)												
1,1,1-Trichloroethane	7000	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
1,1,2-Trichloroethane	100	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
1,1-Dichloroethane	NE	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
1,1-Dichloroethene	10	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
1,2-Dichloroethane	8	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
1,2-Dichloroethene (total)	NE	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
1,2-Dichloropropane	NE	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
2-Butanone (MEK)	4000	0.012 U	0.012 U	0.013 U	0.012 U	0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.013 U
Acetone	8000	0.012 U	0.012 U	0.013 U	0.012 U	0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.013 U
Hexane	NE	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.015	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
Methylene chloride	90	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064	0.0064 U
Tetrachloroethene	10	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U J	0.0061 U	0.0062 U	0.02	0.0064 U
Toluene	20000	0.0082	0.0062 U	0.035	0.0061 U	0.064	0.0062 U	0.010 J	0.0061 U	0.0062 U	0.0096	0.0064 U
Trichloroethene	60000	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0065 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0064 U	0.0064 U
SemiVolatiles (mg/kg)												
Di-n-butyl phthalate	NE	0.41 U	0.41 U	0.42 U	0.4 U	2	0.41 U	0.4 U	0.4 U	0.41 U	0.42 U	0.42 U
Phenanthrene	NE	0.41 U	0.41 U	0.42 U	0.4 U	1.7 U	0.41 U	0.4 U	0.4 U	0.41 U	0.530 J	0.42 U
bis(2-Ethylhexyl)phthalate	50	0.41 U	0.41 U	0.42 U	0.4 U	1.7 U	0.41 U	0.4 U	0.4 U	0.41 U	0.480 J	0.42 U
Metals (mg/kg)												
Arsenic	80	7.5 J	8.9 J	8.3 J	6.4 J	5.1 J	9.9 J	6.3 J	6.1 J	7.3 J	42.5 J	8.6 J
Barium	6000	222	153	153	109	122	138	126	99.6	140	121	151
Cadmium	40	0.62 U	0.62 U	0.63 U	0.61 U	0.65 U	0.62 U	0.61 U	0.61 U	0.62 U	1.2	0.64 U
Chromium *	400	10.9	9.9	16.8	7	9.5	15.7	10.5	12.8	11	8.7	16.3
Lead	NE	32.8	27	15.9	15.6	70.1	13.9	20.5	16.9	22.2	175	20
Mercury	20	0.15	0.12 U	0.15	0.12 U	0.13 U	0.12 U	0.12 U	0.12 U	0.12 U	0.14	0.13 U

Notes: U : Not Detected.  
J : Estimated Value.  
NA : Not Analyzed.  
NE : Not Established.  
\* : Chromium action level is for Chromium VI



**TABLE 6-1**  
**INVESTIGATION OF RUBBLE AREA WEST OF EMPLOYEE PARKING LOT**  
**Concentrations of Compounds Detected - Soil**

		Sample ID		
Parameter	Draft RCRA Subpart S Criteria (mg/kg)	TP-05-SR (Surface)	TP-05-ST (Stain)	TP-05-N (Natural)
Volatiles (mg/kg)				
1,1,1-Trichloroethane	7000	0.0056 U	0.063 U	0.05
1,1,2-Trichloroethane	100	0.0056 U	0.063 U	0.0092
1,1-Dichloroethane	NE	0.0056 U	0.063 U	0.011
1,1-Dichloroethene	10	0.0056 U	0.063 U	0.012
1,2-Dichloroethane	8	0.0056 U	0.063 U	0.013
1,2-Dichloroethene (total)	NE	0.0056 U	0.063 U	0.035
1,2-Dichloropropane	NE	0.0056 U	0.063 U	0.11
2-Butanone (MEK)	4000	0.011 U	0.24	0.013 U
Acetone	8000	0.018 U	1.9	0.013 U
Hexane	NE	0.0056 U	0.063 U	0.0063 U
Methylene chloride	90	0.0056 U	0.063 U	0.0063 U
Tetrachloroethene	10	0.0056 U	0.063 U	0.073
Toluene	20000	0.0056 U	0.063 U	0.0063 U
Trichloroethene	60000	0.0056 U	0.063 U	0.1
SemiVolatiles (mg/kg)				
Di-n-butyl phthalate	NE	0.37 U	0.41 U	0.41 U
Phenanthrene	NE	0.37 U	0.41 U	0.41 U
bis(2-Ethylhexyl)phthalate	50	0.37 U	0.41 U	0.41 U
Metals (mg/kg)				
Arsenic	80	3.8 J	8.8 J	8.5 J
Barium	6000	76.5	233	125
Cadmium	40	2.7	0.63 U	0.63 U
Chromium *	400	2.9	17.3	16.9
Lead	NE	14.5	17.4	15.1
Mercury	20	0.2	0.13 U	0.13 U

Notes: U : Not Detected  
J : Estimated Value  
NA : Not Analyzed  
NE : Not Established  
\* : Chromium action level is for Chromium VI

**TABLE 7-1**  
**BACKGROUND SOIL BORINGS**  
**Concentrations of Compounds Detected - Soil**

Parameter	Draft RCRA Subpart S Criteria (mg/kg)	Sample ID			
		SB-14-0-2	SB-14-4-6	SB-15-0-2	SB-15-4-6
<b>Volatiles (mg/kg)**</b>					
<b>SemiVolatiles (mg/kg)</b>					
Anthracene	NE	0.99	0.39	0.41 U	0.4 U
Benzo(a)anthracene	NE	4	1.4	0.41 U	0.4 U
Benzo(a)pyrene	NE	3.5	1.2	0.41 U	0.4 U
Benzo(b)fluoranthene	NE	5	1.8	0.41 U	0.4 U
Benzo(g,h,i)perylene	NE	2.2	0.71	0.41 U	0.4 U
Benzo(k)fluoranthene	NE	1.3	0.46	0.41 U	0.4 U
Chrysene	NE	3.2	1.2	0.41 U	0.4 U
Dibenz(a,h)anthracene	NE	0.65	0.39 U	0.41 U	0.4 U
Fluoranthene	NE	4.7	2.1	0.41 U	0.4 U
Indeno(1,2,3-cd)pyrene	NE	2.1	0.65	0.41 U	0.4 U
Phenanthrene	NE	3.8	1.8	0.41 U	0.4 U
Pyrene	NE	5.9	2.7	0.41 U	0.4 U
<b>Metals (mg/kg)</b>					
Arsenic	80	15.3 J	7.2 J	4.1 J	1.3 J
Barium	6000	167	156	50	84.5
Chromium *	400	9.5	11	6	6.1
Lead	NE	32.1	36.2	10.2	20.3
<b>Others (mg/kg)</b>					
Extractable Petroleum Hydrocarbons (mg/kg)	NE	79	76	5 U	4.8 U

Notes: U : Not Detected.

J : Estimated Value

NA : Not Analyzed

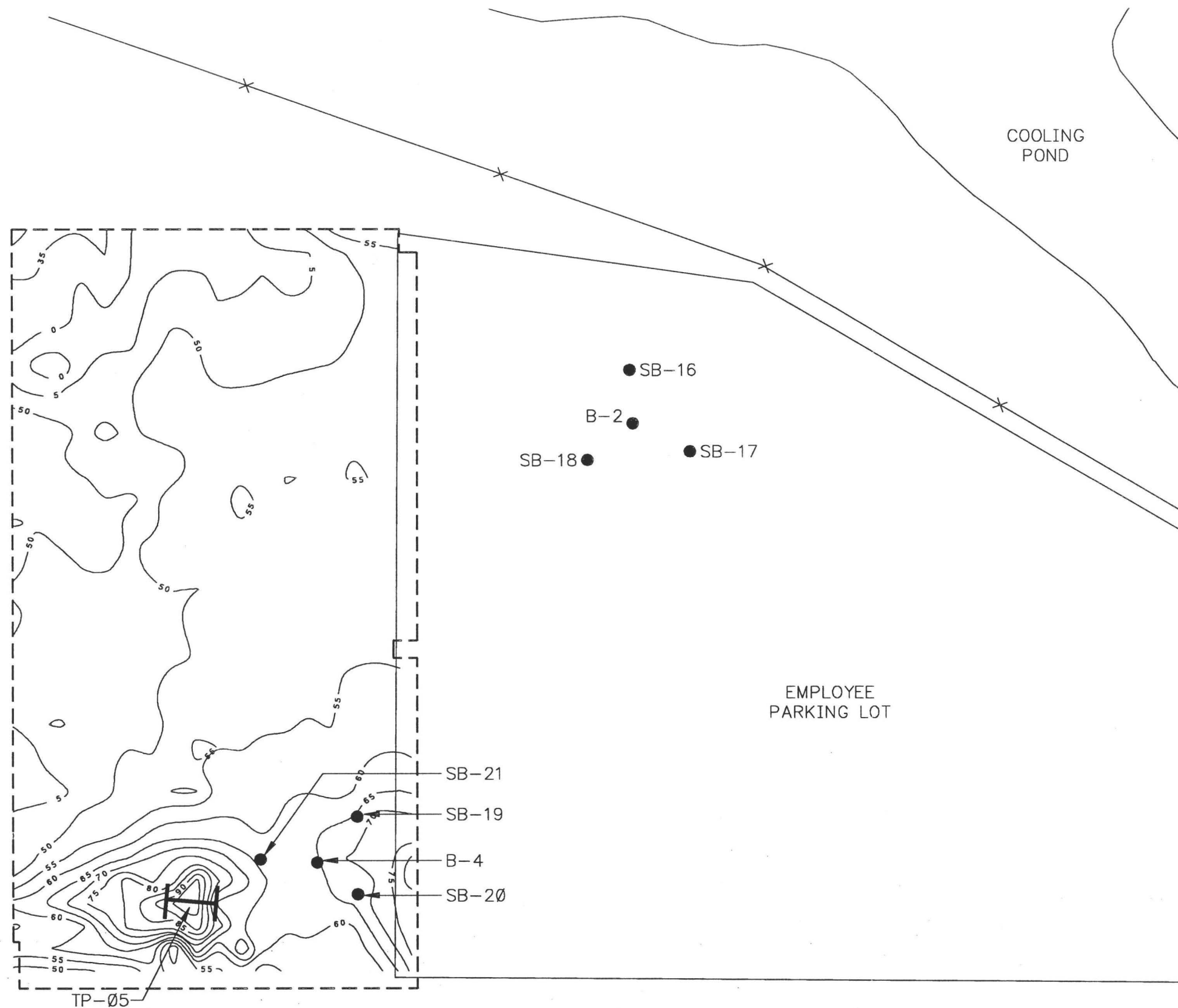
NA : Not Established

\* : Chromium action level is for Chromium VI

\*\* : Samples were analyzed for volatiles however no volatile compounds were detected in any of the soil samples

## DRAWINGS

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# **LEGEND:**

- X—X— FENCE LINE
- 5.0 — CONDUCTIVITY (mmhos/meter)
- BOUNDARIES OF ELECTROMAGNETIC SURVEY
- SB-16 LOCATION OF SOIL BORING
- B-2 LOCATION OF FORMER ESE SOIL BORING
- H LOCATION OF TEST PIT



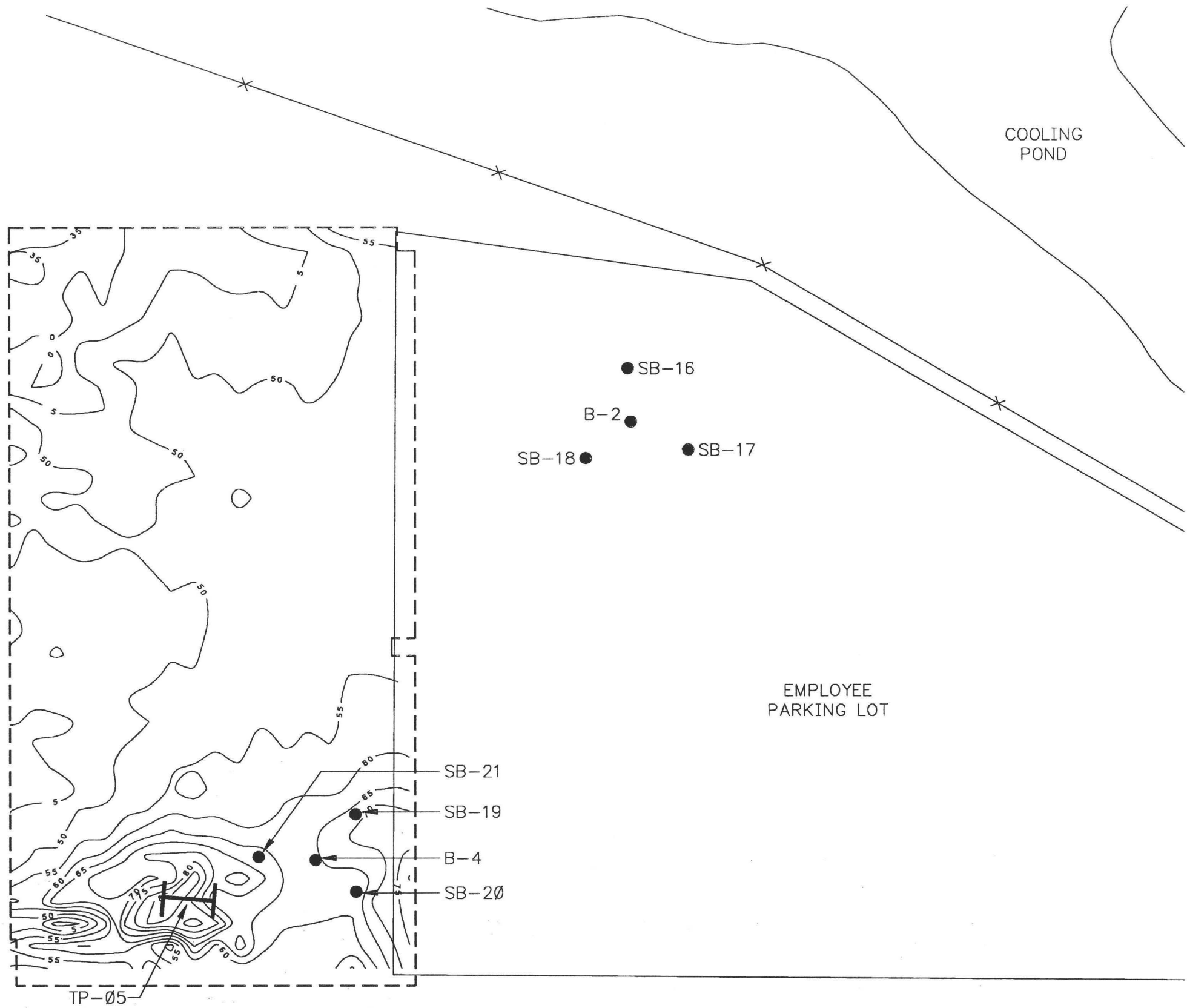
FACILITY AT 3200 MAIN STREET  
KEOKUK, IOWA

**Woodward-Clyde Consultants**  
Engineers, Geologists, And Environmental Scientists

INVESTIGATION OF ALLEGED ON-SITE  
BURIED DRUMS - SOIL BORING, TEST PIT,  
AND ELECTROMAGNETIC SURVEY LOCATIONS

DRAWN: M.A.L.	DATE: 08/11/93	PROJECT NUMBER	DWG. NO.
CHECKED: DWK	DATE: 8/19/93	91C7343-1	2-1

NOTE: ELECTROMAGNETIC SURVEY CONTOURS REPRESENT QUADRATURE  
RESULTS FOR READINGS TAKEN IN A EAST-WEST ORIENTATION.



**LEGEND:**

- X — X — FENCE LINE
- 5.0 — CONDUCTIVITY (mmhos/meter)
- BOUNDARIES OF ELECTROMAGNETIC SURVEY
- SB-16 LOCATION OF SOIL BORING
- B-2 LOCATION OF FORMER ESE SOIL BORING
- ⌏ LOCATION OF TEST PIT

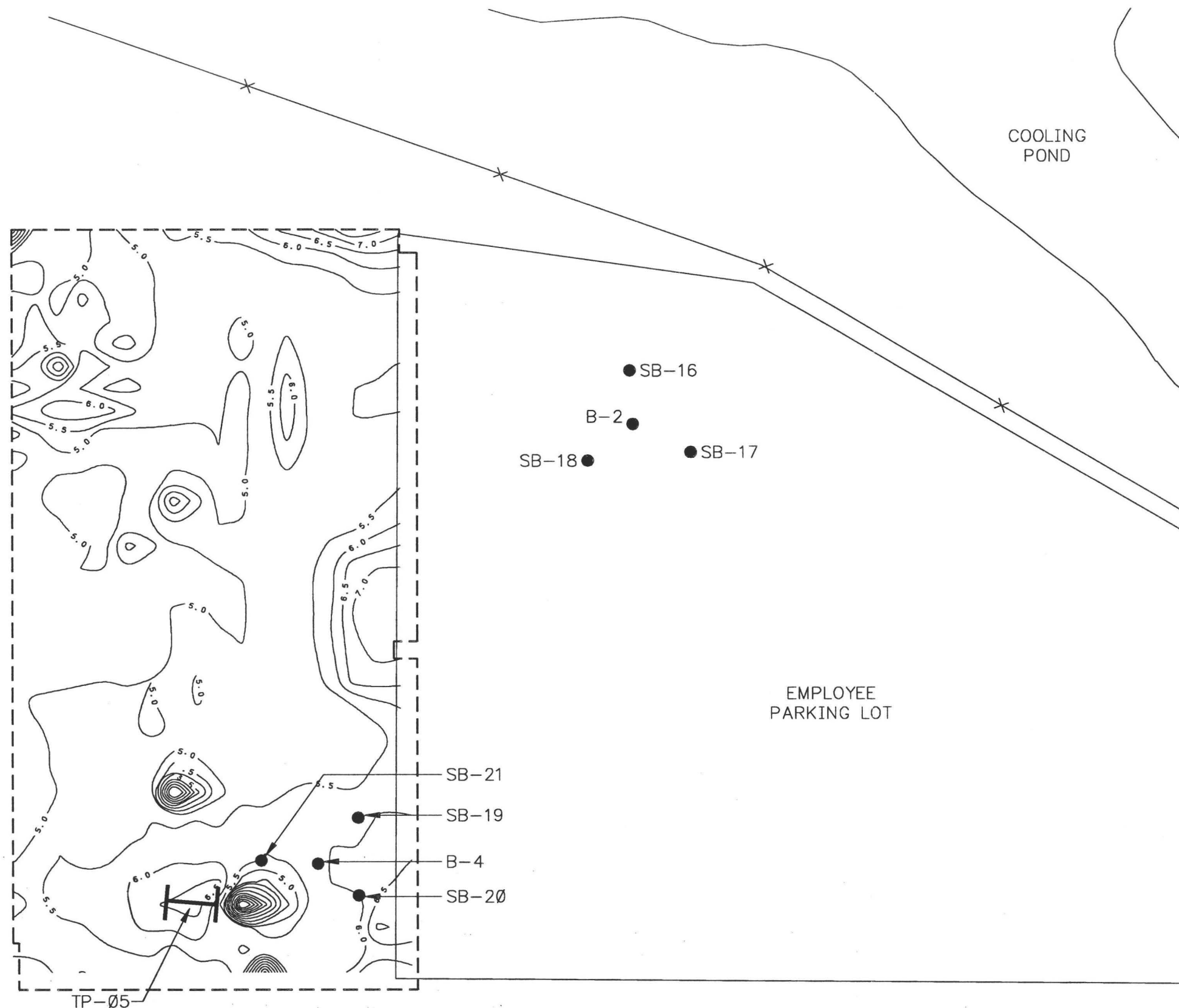


NOTE: ELECTROMAGNETIC SURVEY CONTOURS REPRESENT QUADRATURE RESULTS FOR READINGS TAKEN IN A NORTH-SOUTH ORIENTATION.

FACILITY AT 3200 MAIN STREET KEOKUK, IOWA			
<b>Woodward-Clyde Consultants</b> Engineers, Geologists, And Environmental Scientists			
INVESTIGATION OF ALLEGED ON-SITE BURIED DRUMS - SOIL BORING, TEST PIT, AND ELECTROMAGNETIC SURVEY LOCATIONS			
DRAWN: M.A.L.	DATE: 08/11/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	2-2

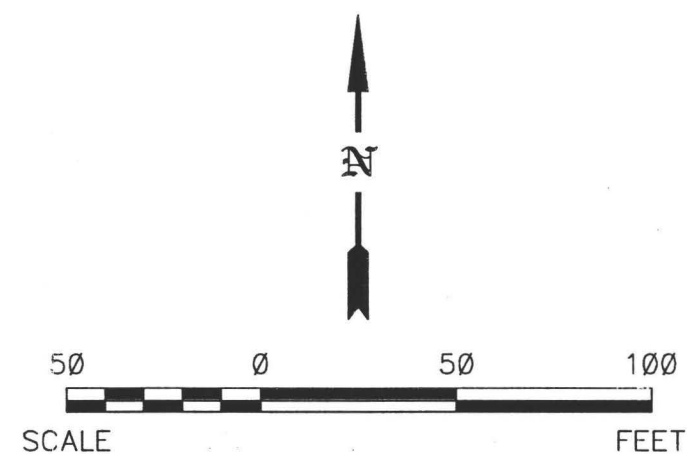
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08/11/93 12:07:42



# **LEGEND:**

- X — X — FENCE LINE
- 5.0 — INPHASE VALUE
- - - - - BOUNDARIES OF ELECTROMAGNETIC SURVEY
- SB-16 LOCATION OF SOIL BORING
- B-2 LOCATION OF FORMER ESE SOIL BORING
- ⌌ LOCATION OF TEST PIT

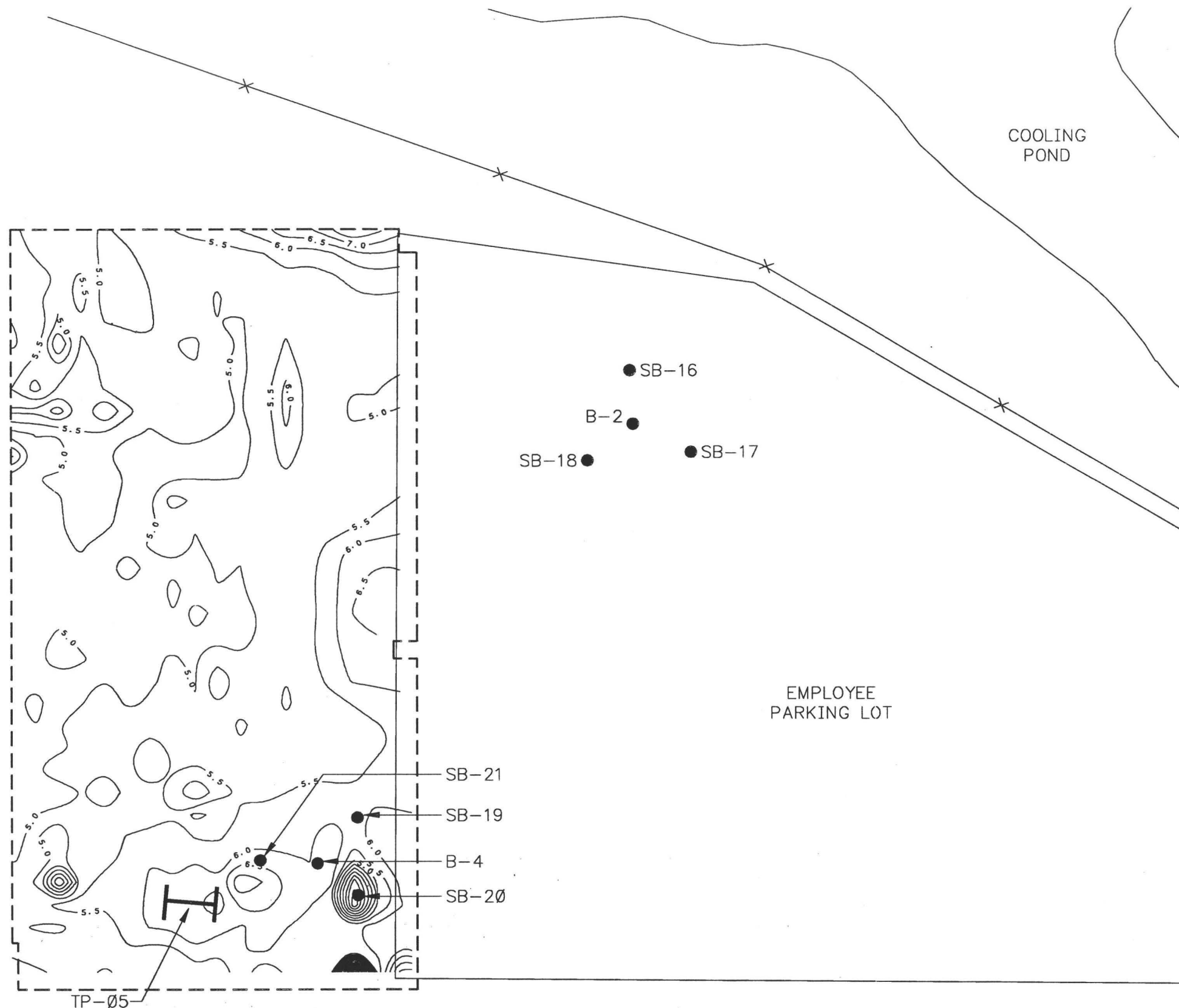


NOTE: ELECTROMAGNETIC SURVEY CONTOURS REPRESENT INPHASE RESULTS FOR READINGS TAKEN IN A EAST-WEST ORIENTATION.

FACILITY AT 3200 MAIN STREET KEOKUK, IOWA			
<b>Woodward-Clyde Consultants</b> Engineers, Geologists, And Environmental Scientists			
INVESTIGATION OF ALLEGED ON-SITE BURIED DRUMS - SOIL BORING, TEST PIT, AND ELECTROMAGNETIC SURVEY LOCATIONS			
DRAWN: M.A.L.	DATE: 08/11/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	2-3

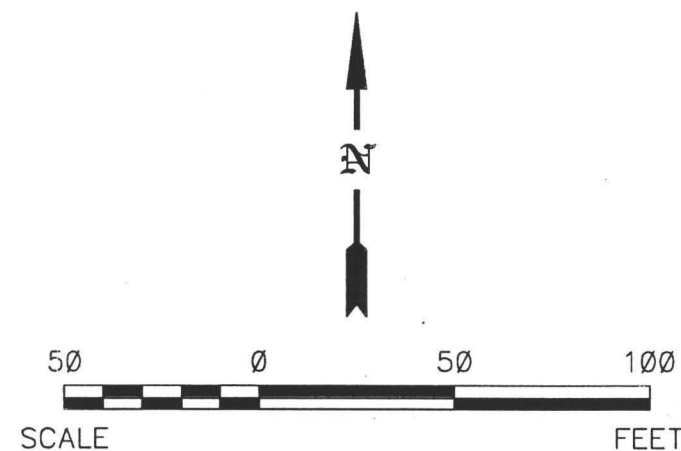
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# LEGEND:

- X — X — FENCE LINE
- 5.0 — INPHASE VALUE
- - - - - BOUNDARIES OF ELECTROMAGNETIC SURVEY
- SB-16 LOCATION OF SOIL BORING
- B-2 LOCATION OF FORMER ESE SOIL BORING
- H LOCATION OF TEST PIT

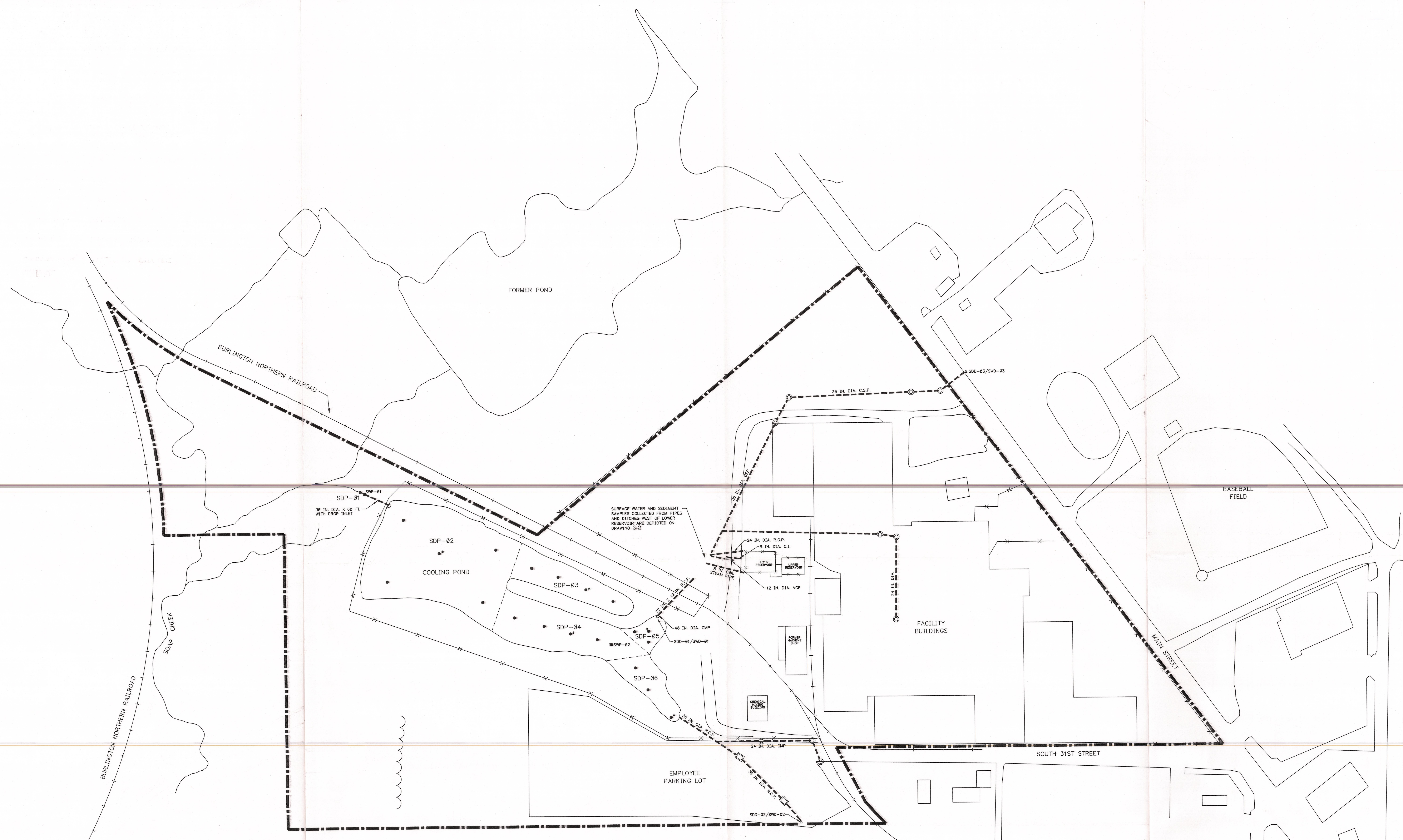


NOTE: ELECTROMAGNETIC SURVEY CONTOURS REPRESENT INPHASE RESULTS FOR READINGS TAKEN IN A NORTH-SOUTH ORIENTATION.

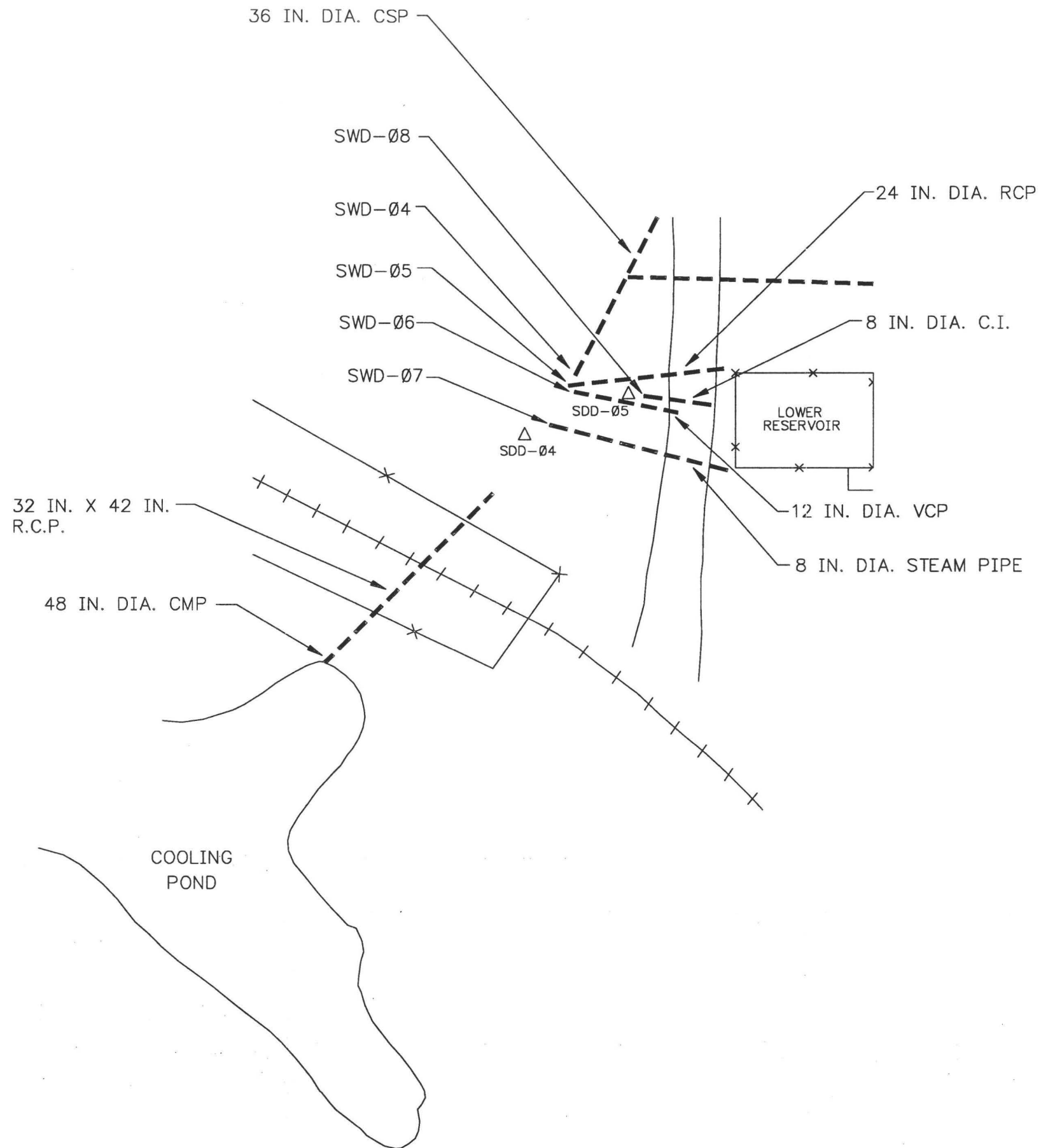
FACILITY AT 3200 MAIN STREET KEOKUK, IOWA			
<b>Woodward-Clyde Consultants</b> Engineers, Geologists, And Environmental Scientists			
INVESTIGATION OF ALLEGED ON-SITE BURIED DRUMS - SOIL BORING, TEST PIT, AND ELECTROMAGNETIC SURVEY LOCATIONS			
DRAWN: M.A.L.	DATE: 08/11/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	2-4

ACAD FILE: UTC-12









**LEGEND:**



RAILROAD TRACKS



FENCE LINE



PIPE LINE



DITCH SEDIMENT  
SAMPLING LOCATION

SWD-04

DISCHARGE PIPE SURFACE  
WATER SAMPLE LOCATION



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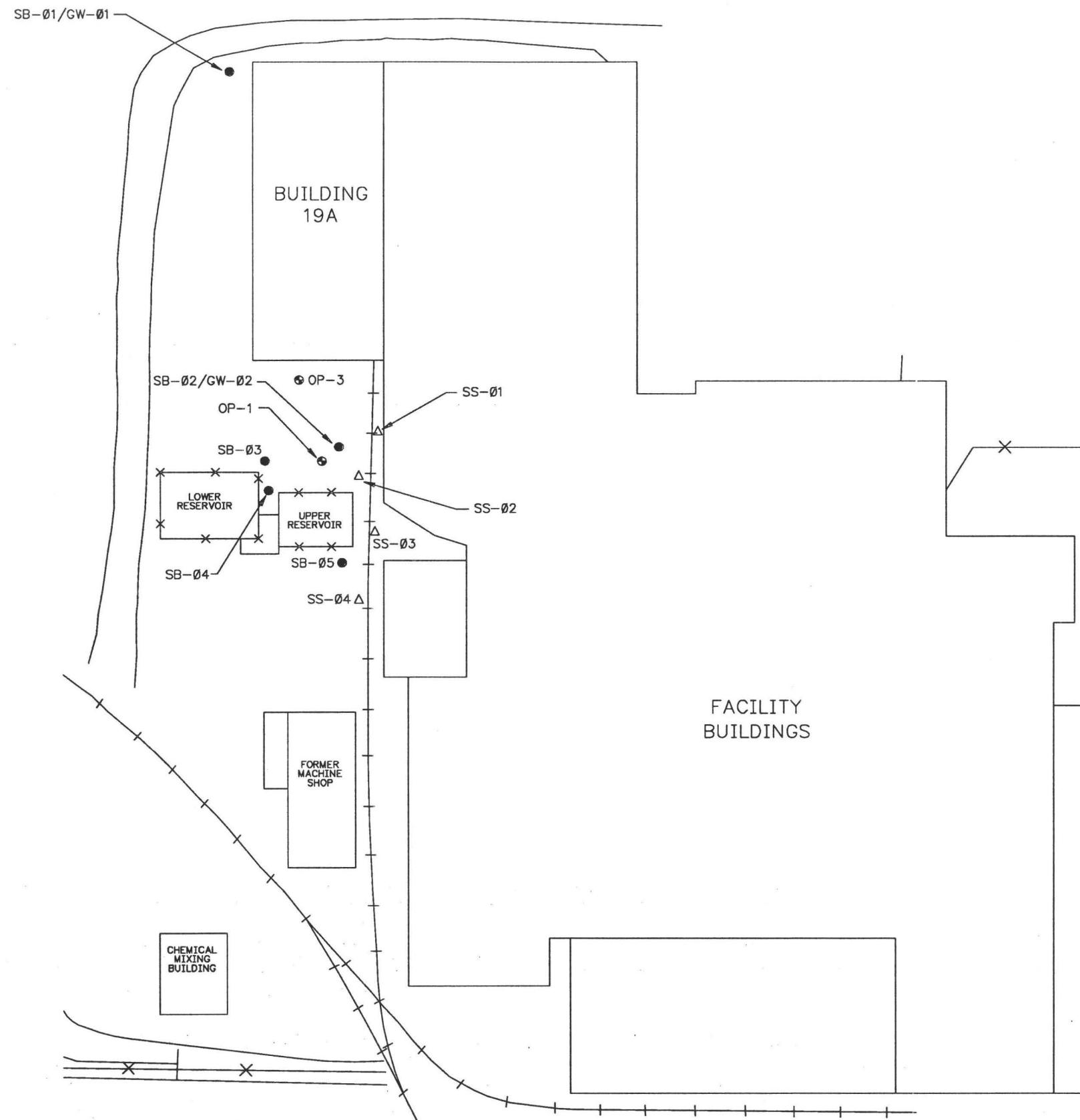
**Woodward-Clyde Consultants**  
Engineers, Geologists, And Environmental Scientists



INVESTIGATION OF COOLING POND AND  
DITCHES - DISCHARGE PIPE AND DITCH  
SAMPLE LOCATIONS

DRAWN: D.R.T.	DATE: 07/26/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	3-2

ACAD FILE: UTC-7



# LEGEND:

RAILROAD TRACKS

FENCE LINE

SB-01/GW-01  
LOCATION OF SOIL BORING AND GROUNDWATER GRAB SAMPLES

OP-3  
LOCATION OF EXISTING GROUNDWATER MONITORING WELLS FROM WHICH SAMPLES WERE COLLECTED

SS-01  
LOCATION OF SURFACE SOIL SAMPLES



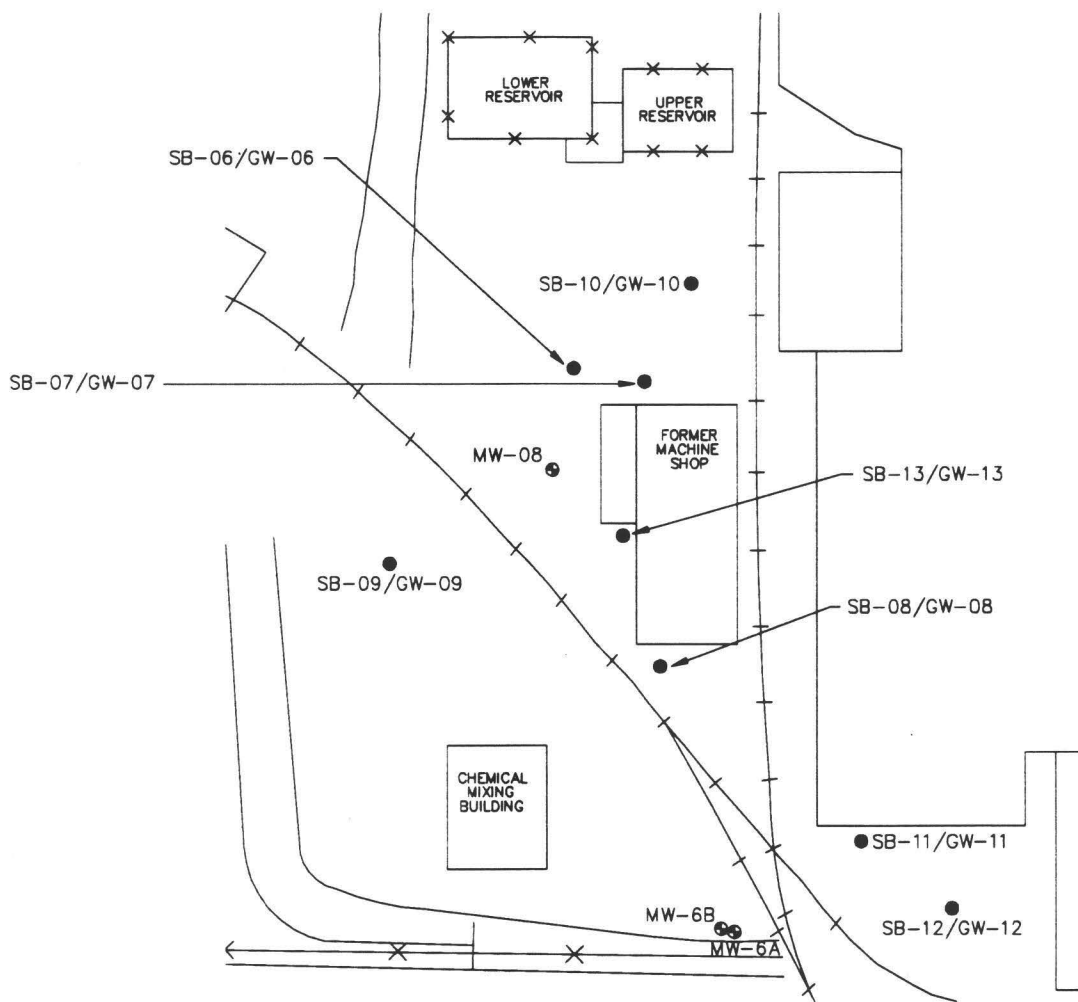
FACILITY AT 3200 MAIN STREET  
KEOKUK, IOWA

**Woodward-Clyde Consultants**  
Engineers, Geologists, And Environmental Scientists

INVESTIGATION OF APPARENT SPILL AREAS-  
SOIL BORING, GROUNDWATER SAMPLE, AND  
GROUNDWATER GRAB SAMPLE LOCATIONS

DRAWN: D.R.T.	DATE: 07/22/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	4-1

ACAD FILE: UTC-4



# **LEGEND:**

—+—+— RAILROAD TRACKS

—X—X— FENCE LINE

SB-13/GW-13  
● LOCATION OF SOIL BORING AND GROUND-WATER GRAB SAMPLE

MW-08  
● LOCATION OF EXISTING GROUNDWATER MONITORING WELL

100 0 100 200  
SCALE FEET

**FACILITY AT 3200 MAIN STREET  
KEOKUK, IOWA**

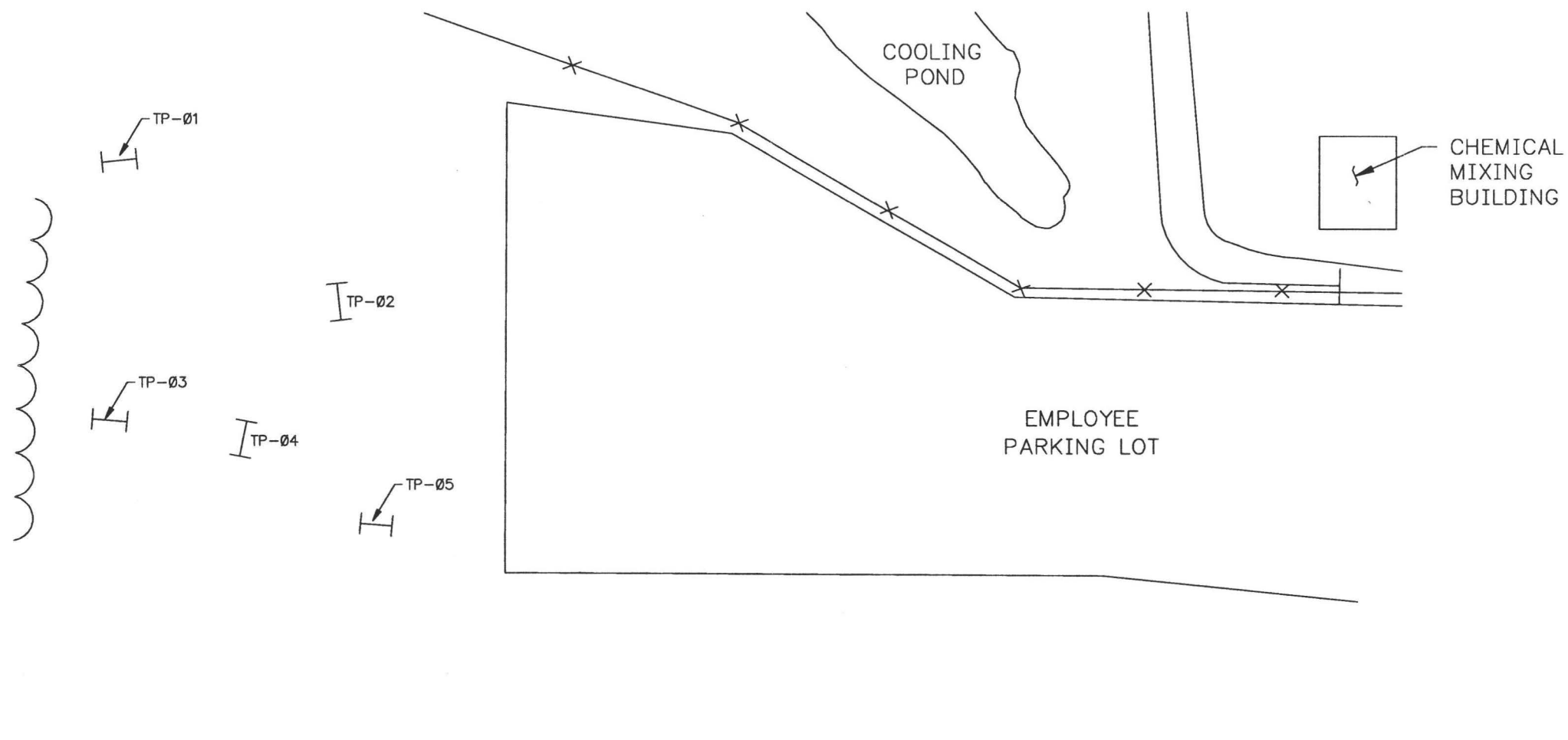
**Woodward-Clyde Consultants**  
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**INVESTIGATION OF SECONDARY SOLVENT SOURCE  
AREAS IN FILL MATERIAL - SOIL BORING AND  
GROUNDWATER GRAB SAMPLE LOCATIONS**

DRAWN: D.R.T.	DATE: 07/27/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	<b>91C7343-1</b>	<b>5-1</b>

ACAD FILE: UTC-3



**LEGEND:**



FENCE LINE



TREE LINE



LOCATION OF TEST PIT

NOTE: TEST PIT TP-05 WAS EXCAVATED IN CONJUNCTION WITH THE INVESTIGATION OF THE ALLEGED ON-SITE BURIED DRUMS.



FACILITY AT 3200 MAIN STREET  
KEOKUK, IOWA

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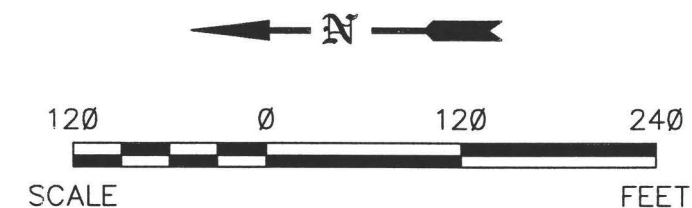
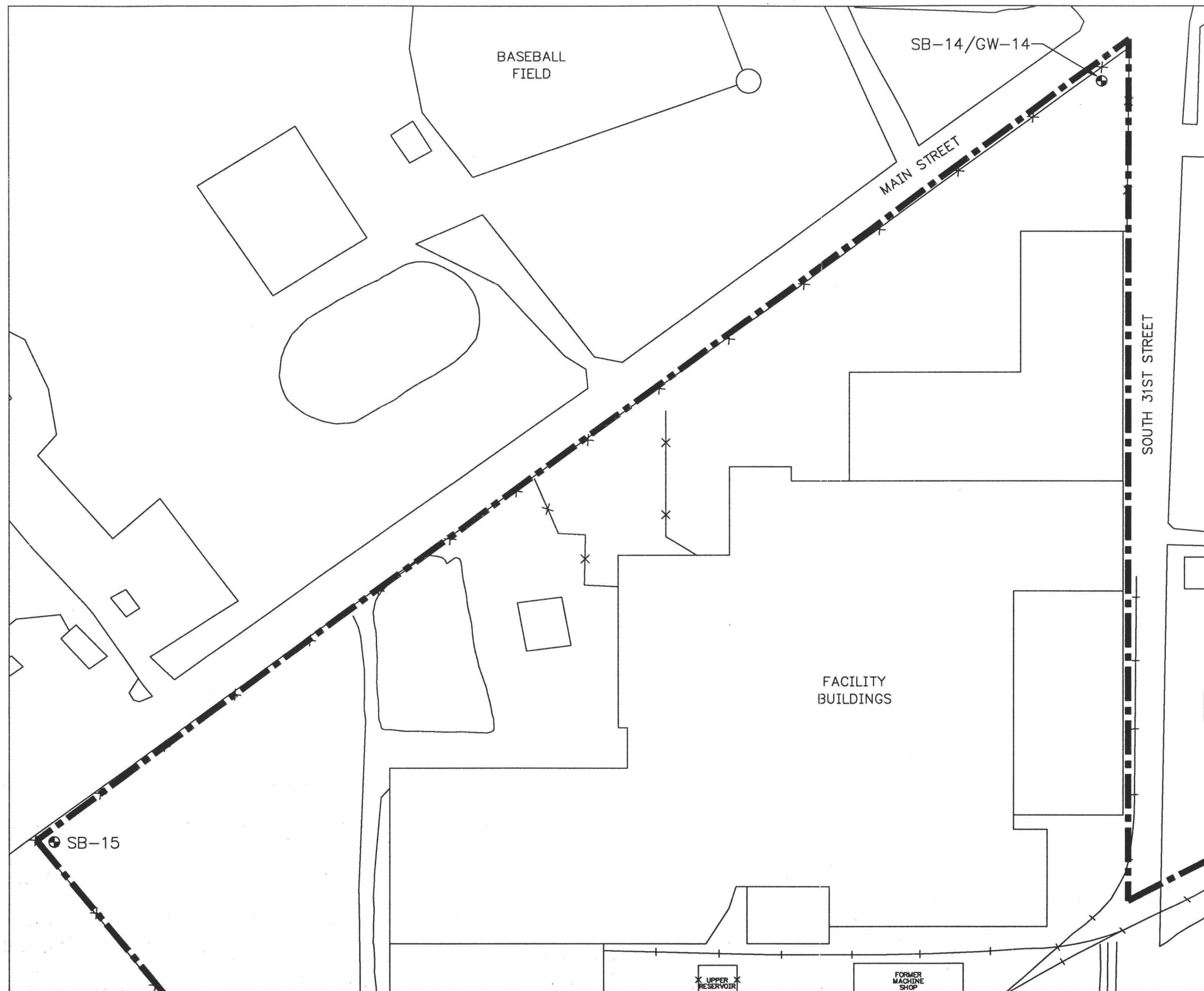


INVESTIGATION OF RUBBLE AREA  
WEST OF EMPLOYEE PARKING LOT -  
TEST PIT LOCATIONS

DRAWN: D.R.T.	DATE: 07/21/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	6-1

ACAD FILE: UTC-2

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FACILITY AT 3200 MAIN STREET  
KEOKUK, IOWA

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BACKGROUND SOIL BORINGS -  
SOIL BORING AND  
GROUNDWATER GRAB SAMPLE LOCATIONS

DRAWN: M.A.L.	DATE: 08/02/93	PROJECT NUMBER	DWG. NO.
CHECKED: DLK	DATE: 8/19/93	91C7343-1	7-1

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